**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of:

ANDREAS BACHER ET AL.

Serial No.: 10/618,936

Filed: July 14, 2003

Group Art Unit: 1714

Examiner: Vickey M. Ronesi

For: SILANE-CONTAINING POLYVINYL ALCOHOL FOR COATING SLIPS

Attorney Docket No.: WAS 0595 PUS

# REPLY BRIEF UNDER 37 C.F.R. § 41.41

Mail Stop Appeal Brief - Patents
Commissioner for Patents
U.S. Patent & Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This Reply Brief is in response to the Examiner's Answer mailed on June 8, 2006 for the above-identified patent application.

Appellants find it necessary to briefly comment on the Examiner's Answer in order to correct certain mischaracterizations occurring therein.

First, on page 4, last paragraph of the Answer, the Examiner apparently scolds the Appellants for not including the entire text from *Schilling* cited by the Examiner (column

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2, lines 7-34). Appellants had reproduced column 2, lines 7-24 only, on page 4 of their brief. The portion recited by Appellants makes it clear that *Schilling* does not discuss or even hint at any storage stability problem. The Examiner therefore apparently believes that such a teaching must be found in lines 25-34. Reproduced below is the complete citation, with that part not recited previously by Appellants underlined:

> Due to their excellent pigment-binding power and support effect for optical brighteners, two serious disadvantages of these [prior art] cobinders are accepted for industrial application. Fully-saponified polyvinyl alcohols are virtually insoluble in water at room temperature. For conversion into an aqueous solution, a polyvinyl alcohol suspension must be stirred vigorously for a relatively long time at at least 90.degree. C. which ultimately encumbers the papermaking process due to the provision of dissolving stations and additional energy costs. The second disadvantage is linked with "pigment shock". When the polyvinyl alcohol solution is added to the pigment slurry, a momentary steep increase in the viscosity of the coating slips is produced. This can only be decreased rapidly with suitable stirrers which apply very high shear forces, or by adding additional auxiliaries, the so-called "anti-shock agents".
>
> OBJECTS OF THE INVENTION
>
> It is an object of the invention to avoid the difficulties and disadvantages described above in the preparation of coated flat structures, for example printing bases, particularly coated papers, boards and/or cardboards, without losing the advantage of the known slips.
>
> This and other objects and advantages of the invention will become obvious from the following detailed description.

As can be seen, the “missing” portion also fails to discuss or disclose storage stability.

The Examiner then goes on to discuss an alleged improvement in solubility by *Schilling* (which he does not teach) and equates improved solubility (not taught) with storage stability. The two problems addressed by *Schilling* are ease of dissolution (faster dissolving rate) and minimizing pigment shock. The fully hydrolyzed polyvinyl alcohol homopolymers that *Schilling* replaces were already water soluble. There is no indication anywhere in *Schilling* that there was any problem with solubility; only with dissolution rate. Both the homopolymeric polyvinyl alcohol and *Schilling's* copolymer polyvinyl alcohols remain soluble once dissolved. There is no "instability" here.

Moreover, the Examiner cannot merely "make up" an instability scenario. In Applicants' specification, a <u>specific</u> type of instability is discussed: an increase in viscosity upon storage. It is this instability which is addressed by the Applicants, and not some other kind of instability.

The Examiner attempts to fabricate storage stable silane-containing polymers of *Maruyama et al.* by citing that the reactive groups "*may* from siloxane bonds," implying that they also may <u>not</u> from siloxane bonds. However, this reading of *Maruyama* is taken out of context, <u>and does not even apply to use solutions of silane-containing PVA</u>. The entire section is reproduced below:

> The saponification temperature is usually in the range from 10° to 50°C. As the result of saponification reaction, the vinyl ester units are saponified partly or to a great extent, and converted into the vinyl alcohol units. The ratio of conversion or the degree of saponification may be any value according to the intended object of use. During the saponification reaction, alkoxyl group, or acyloxyl group connected to the silicon in the silicon-containing olefinic unsaturated monomer units is also saponified partly or to a great extent into a silanol group or an alkali salt of silanol. these groups may partly form siloxane bonds when the modified PVA after saponification is dried. This is within the scope of this invention.

The cited passage refers to preparation of the polymer, by saponifying a vinyl acetate/vinyl silane copolymer. The passage indicates that siloxane groups may form when drying the saponified product. The passage does not indicate that solutions of the silane-containing PVA exhibit a great viscosity increase during storage.

The Examiner further indicates that *Schilling* "is open to the use of other monomers." This is true. However, these other monomers are very limited, and are described in *Schilling* at column 3, line 57 to column 4, line 2. If *Schilling* believed that any other of the many possible comonomers known at the time of his invention were useful, e.g. styrene, vinyl halides, (meth)acrylate esters, unsaturated carboxylic acids, unsaturated silanes, etc., he certainly would have mentioned them. However, he did not.

The ultimate legal conclusion is whether one skilled in the art of paper slips would have been motivated by the references to construct a terpolymer from vinyl ester, 1-alkylvinyl ester, and unsaturated silane, followed by saponifying to obtain the corresponding polyvinyl alcohol terpolymer. *Schilling* provides no such motivation; the *Schilling* monomers do not even include any silane monomers, despite the fact that these monomers were well known. *Maruyama* provides no such motivation; when he desires other monomer units to be present, he incorporates them into his coating compositions as a separate PVA copolymer. *See*, column 8, lines 36-45.

Finally, the Examiner denigrates the values of Applicants' comparative showing. As Applicants' attorney understands the law, and contrary to the Examiner's reliance on *In re Greenfield*, a single example can be sufficient to rebut *prima facie* obviousness, even when the claims cover numerous species. The issue of how many examples are required is a factual one and varies from case to case. One factor, for example, is to what extent the evidence provided by the example or examples can be generalized. Here, the initial polymers are vinyl ester polymers which are subsequently hydrolyzed to provide 70-100% of vinyl alcohol groups.

Thus, regardless of which vinyl ester one starts with, e.g. vinyl acetate, vinyl propionate, vinyl formate, etc., after saponification there will be but few of such residues left, the bulk having been hydrolyzed to vinyl alcohol-equivalent units. The isopropenyl acetate used as the second monomer is typical of the relatively small class of 1-alkylvinyl esters encompassed by the claims. The silane employed, vinyltriethoxysilane, is the silane typically used in preparing silane-modified polyvinyl alcohols in the industry, and as taught by *Maruyama*. It is also one of *Maruyama's* preferred silanes, and one actually used in his examples.

The Examiner has never previously alleged that the comparative showing is not commensurate with the scope of the claims, and in any case, such an argument can hardly extend, even if correct, to claims 2 and 3, which require, respectively, the vinyl ester to be vinyl acetate and the 1-alkylvinyl ester to be 1-methylvinylacetate (isopropenyl acetate). The comparative example employed the monomers which it did because it was closest to *Maruyama* and therefore most probative.

Reversal of the rejection of record is solicited.

Respectfully submitted,

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By: [signature]

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Date: August 8, 2006

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